Check List **4**(3): 297–300, 2008.
ISSN: 1809-127X

NOTES ON GEOGRAPHIC DISTRIBUTION

Cnidaria, Scleractinia, *Tubastraea coccinea* Lesson, 1829 and *Tubastraea tagusensis* Wells, 1982: Distribution extension.

Joel Christopher Creed [1]
Anderson Eduardo Silva Oliveira [1, 2]
Alline F. De Paula [1]

[1] *Universidade do Estado do Rio de Janeiro, Instituto de Biologia Roberto Alcântara Gomes, Departamento de Ecologia. Rua São Francisco Xavier 524, PHLC Sala 525/3. CEP 20550-900. Rio de Janeiro, RJ, Brazil. E-mail*: jcreed@uerj.br

[2] *Universidade do Estado do Rio de Janeiro, Programa de Pós-Graduação em Meio Ambiente. Rua São Francisco Xavier 524, Bloco F, sala 12005. CEP 20550-900. Rio de Janeiro, RJ, Brazil.*

The genus *Tubastraea* Lesson, 1829 was first reported for Brazil by Castro and Pires (2001). De Paula and Creed (2005) reported the genus at 31 locations on rocky shores at Ilha Grande, Ilha Grande Bay, but did not identify the species. De Paula and Creed (2004) were the first to report the species *Tubastraea coccinea* Lesson, 1829 and *Tubastraea tagusensis* Wells, 1982 in southeastern Brazil, at two sites at Ilha Grande, Ilha Grande Bay, state of Rio de Janeiro.

The two species are considered non-indigenous to the south-western Atlantic because, although extremely conspicuous, they have not been previously reported by coral specialists in studies of Ilha Grande Bay (Castro et al. 1999). De Paula and Creed (2004) listed observations on oil and gas platforms in Brazilian waters and De Paula and Creed (2005) presented compelling evidence that these vectors were responsible for this double-species introduction at Ilha Grande Bay.

As part of a large marine biodiversity project carried out in 2003 and more localized investigations of the biology and ecology of these species ongoing since 2000, this paper presents 33 new locality records for *T. coccinea* and 37 new locality records for *T. tagusensis*.

Tubastraea coccinea: Angra dos Reis: Ilha Itacuatiba (23°04'12" S, 44°15'11" W); Ilha dos Macacos (23°04'36" S, 44°13'47" W and 23°04'42" S, 44°13'28" W); Ilha Aroeira (23°04'40" S, 44°14'23" W); Ilha Queimada Grande (23°05'05" S, 44°18'36" W), Ilha Redonda (23°05'12" S, 44°14'23" W); Ilha do Abraão (23°06'53" S, 44°09'59" W); Ilhas do Macedo, (23°08'06" S 44°09'58" W); Ilha Longa (23°08'22" S 44°19'34" W). Ilha Grande: Japariz (23°05'22" S, 44°12'59" W); Lagoa Azul (23°05'05" S, 44°14'33" W); Freguesia de Santana (23°05'42" S, 44°14'49" W); Guaxuma (23°05'50" S, 44°12'13" W); Saco do Bananal (23°06'01" S, 44°15'08" W); Ponta do Bananal (23°06'02" S, 44°15'28" W); Ponta do Barreto (23°06'08" S, 44°11'31" W): Enseada da Estrela (23°06'19" S, 44°11'42" W); Ponta Grossa de Sítio Forte (23°06'47" S, 44°17'49" W); Ponta Matariz (23°06'52" S, 44°15'40" W); Ponta de Ubatuba (23°06'54" S, 44°17'38" W); Ponta do Abraão (23°07'06" S, 44°10'10" W); Enseada da Feiticeira, (23°07'10" S, 44°11'06" W); Praia dos Morcegos, (23°07'28" S, 44°08'51" W); Praia dos Mangues (23°07'40" S, 44°07'46" W); Sítio Forte (23°07'51" S, 44°17'00" W); Praia da Longa (23°08'11" S, 44°18'46" W); Ponta Longa (23°08'14" S, 44°19'35" W); Araçatiba (23°09'19" S, 44°20'01" W); Praia Vermelha (23°09'35" S, 44°20'53" W); Saco dos Castelhanos (23°09'49" S, 44°05'56" W); Ponta dos Micos (23°09'56" S, 44°21'58" W); Gruta Acaiá (23°10'00" S, 44°22'16" W); Ponta Acaiá (23°10'02" S, 44°22'21" W).

Tubastraea tagusensis: Angra dos Reis: Ilha de Búzios (23°03'34" S, 44°25'14" W); Ilha Itacuatiba (23°04'12" S, 44°15'11" W); Ilha dos Macacos (23°04'36" S, 44°13'47" W and 23°04'42" S, 44°13'28" W); Ilha Aroeira (23°04'40" S, 44°14'23" W); Ilha Queimada Grande (23°05'05" S, 44°18'36" W); Ilha Redonda (23°05'12" S,

Check List **4**(3): 297–300, 2008.
ISSN: 1809-127X

NOTES ON GEOGRAPHIC DISTRIBUTION

44°14'23" W); Ilha do Abraão (23°06'53" S, 44°09'59" W); Ilha dos Morcegos (23°07'34" S, 44°09'00"); Ilha Jorge Grego (23°13'16" S, 44°09'00" W). Ilha Grande: Japariz, (23°05'22" S, 44°12'59" W); Lagoa Azul (23°05'05" S, 44°14'33" W), Freguesia de Santana (23°05'42" S, 44°14'49" W); Guaxuma (23°05'50" S, 44°12'13" W); Saco do Bananal (23°06'01" S, 44°15'08" W); Ponta do Bananal (23°06'02" S, 44°15'28" W); Ponta do Barreto (23°06'08" S, 44°11'31" W); Enseada da Estrela (23°06'19" S, 44°11'42" W); Ponta Grossa de Sítio Forte (23°06'47" S, 44°17'49" W); Ponta Matariz (23°06'52" S, 44°15'40" W); Ponta de Ubatuba (23°06'54" S, 44°17'38" W); Ponta do Abraão (23°07'06" S, 44°10'10" W); Enseada da Feiticeira (23°07'10" S, 44°11'06" W); Ponta Grossa (23°07'13" S, 44°07'33" W); Praia dos Morcegos (23°07'28" S, 44°08'51" W); Sítio Forte (23°07'51" S, 44°17'00" W); Crena (23°08'08" S, 44°09'25" W); Praia da Longa (23°08'11" S, 44°18'46" W); Ponta Longa (23°08'14" S 44°19'35" W); Ilha Longa (23°08'22" S, 44°19'34" W); Araçatiba (23°09'19" S, 44°20'01" W); Praia Vermelha (23°09'35" S, 44°20'53" W); Saco dos Castelhanos (23°09'49" S, 44°05'56" W); Ponta dos Micos (23°09'56" S, 44°21'58" W); Gruta Acaiá (23°10'00" S, 44°22'16" W); Ponta Acaiá (23°10'02" S, 44°22'21" W). Parati: Ponta da Mesa, Enseada do Pouso (23°16'05" S, 44°32'27" W).

Our current findings show that the sun corals *T. coccinea* and *T. tagusensis* are now widely distributed in Ilha Grande Bay but concentrated in Ilha Grande (Figures 1 and 2). *T. tagusensis* was slightly more common than *T. coccinea* at Ilha Grande Bay as *T. coccinea* was found at 33 sites (50 %) and *T. tagusensis* at 37 sites (56 %) of the 66 studied sites (Table 1). However, most of the studied sites were concentrated at Ilha Grande or close by (60 %) and when analyzed separately, the data revealed that more than three-quarters of sites in Ilha Grande were infested by the two species but only eight-to-fifteen percent of sites in the rest of the Bay were infested (*Tubastraea coccinea* and *T. tagusensis*, respectively) (Table 1). *T. tagusensis* was found in the west and north of Ilha Grande Bay and at an island south of Ilha Grande (Jorge Grego) which considerably increased the species' range relative to *T coccinea*.

The sun corals have demonstrated an extremely rapid range expansion along the coastline of Rio de Janeiro State, occupying the infralittoral fringe and subtidal zones of these tropical rocky shores, where the subtidal benthic community consists of macroalgae (multi-species turf forming, crustose coralline and foliose brown algae), heterotrophic filter feeders (mainly sponges, bryozoans and ascidians) and symbiotic autotrophs (corals such as *Mussismilia hispida* (Verrill 1902) and zoanthid mats - mainly *Palythoa caribeorum* (Duchassaing and Michelotti 1860).

Previous studies have reported the deleterious effects of the non-indigenous sun corals on the native biota of Ilha Grande Bay and the two species are considered to be harmful invasive species that represent a threat to the biodiversity and native community of rocky shores (Creed 2006).

The occurrence and range expansion of these exotic invasive species at Ilha Grande Bay is of concern because of the high marine biological diversity and ecological importance of the region (Creed et al. 2007).

Table 1. Number and proportion of sites where *Tubastraea* spp. were present in Ilha Grande Bay, Brazil.

Region	Total *n*	Infested sites (*n*)		Infested sites (%)	
		T. tagusensis	*T. coccinea*	*T. tagusensis*	*T. coccinea*
Ilha Grande	40	33	31	83	78
Not Ilha Grande	26	4	2	15	8
Ilha Grande Bay	66	37	33	56	50

Check List **4**(3): 297–300, 2008.
ISSN: 1809-127X

NOTES ON GEOGRAPHIC DISTRIBUTION

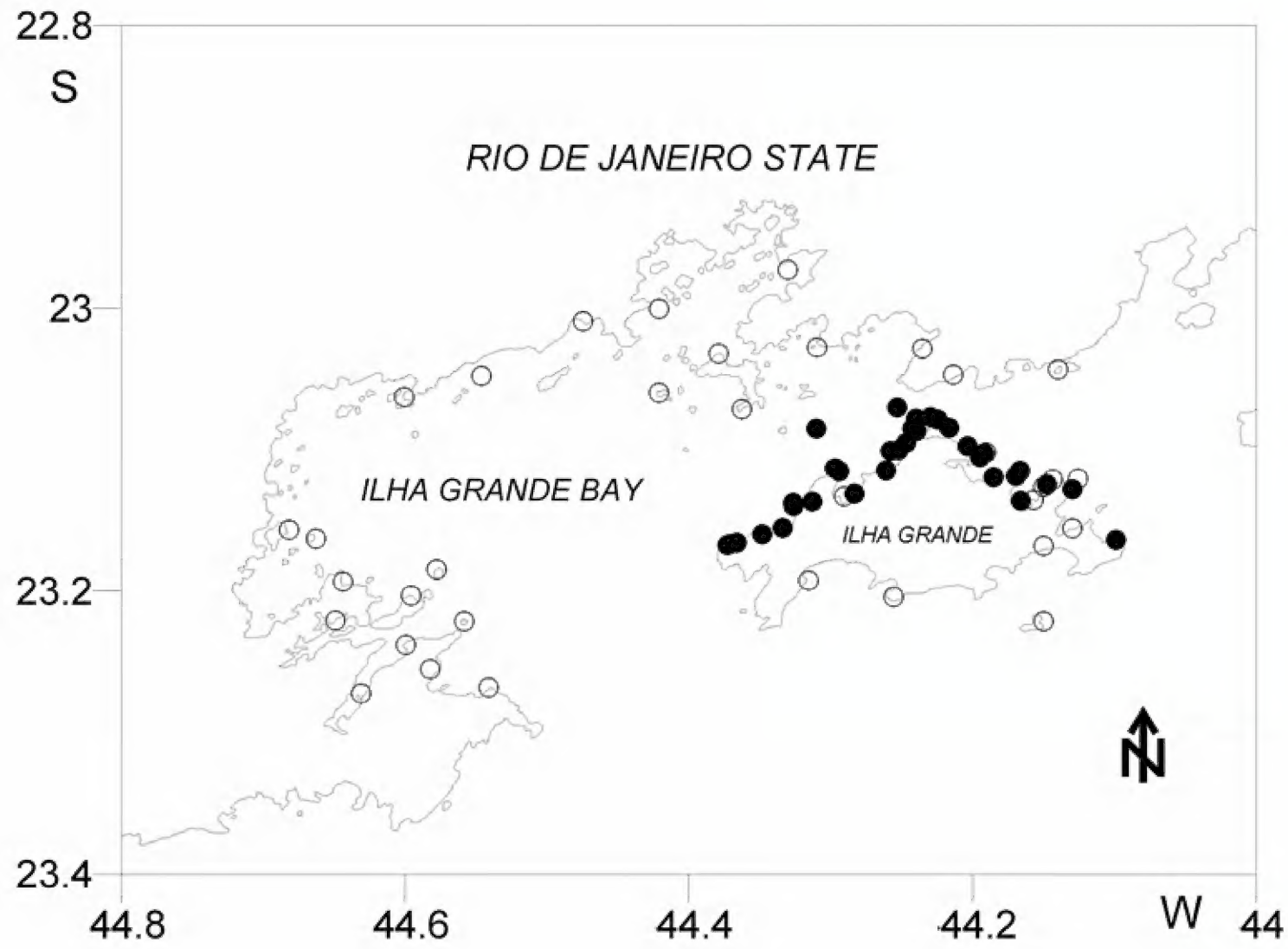

Figure 1. Records of *Tubastraea coccinea* in Ilha Grande Bay, state of Rio de Janeiro, Brazil, provided by this study. Open circles, absent; closed circles, present.

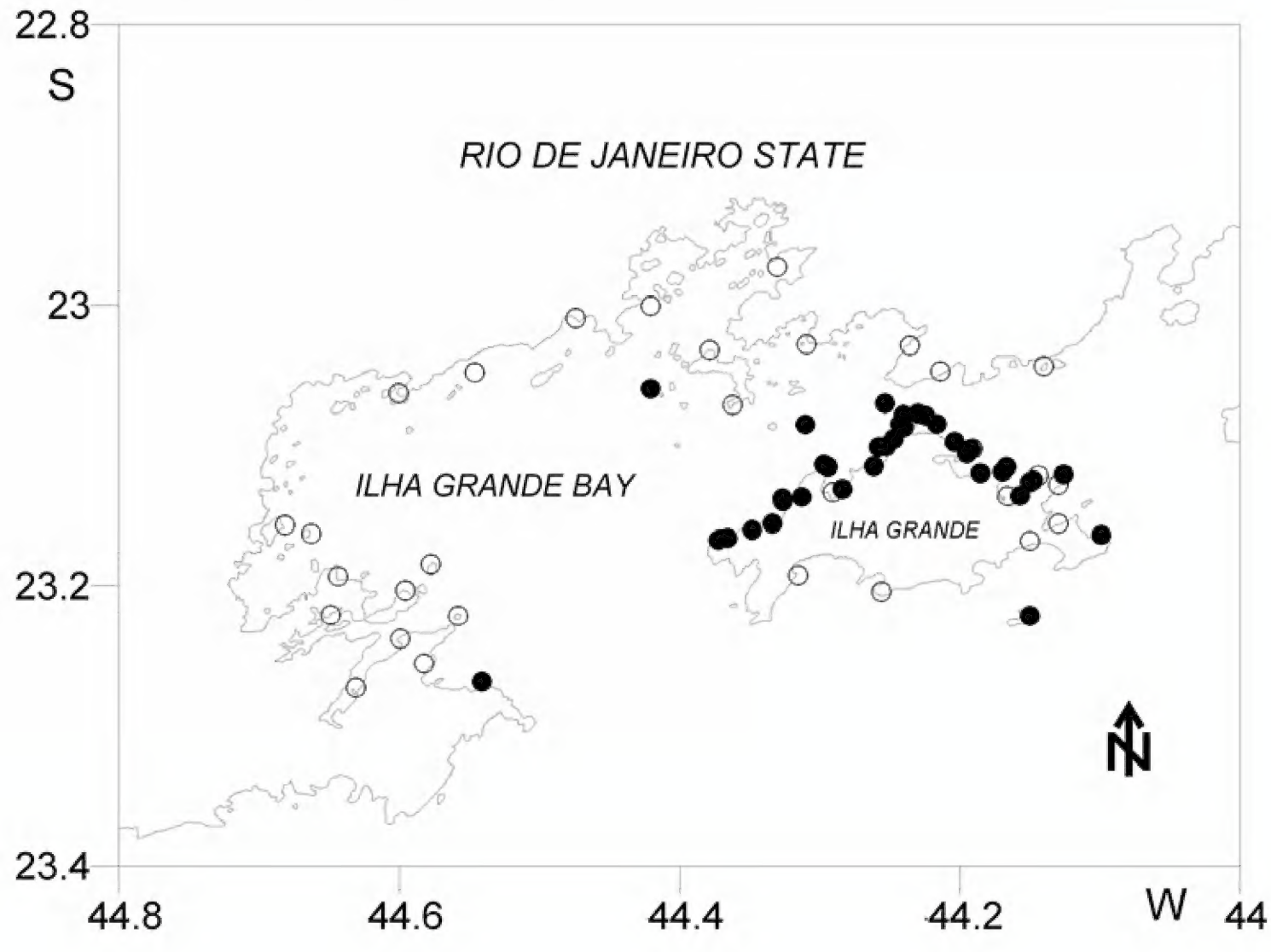

Figure 2. Records of *Tubastraea tagusensis* in Ilha Grande Bay, state of Rio de Janeiro, Brazil, provided by this study. Open circles, absent; closed circles, present.

Check List **4**(3): 297–300, 2008.
ISSN: 1809-127X

NOTES ON GEOGRAPHIC DISTRIBUTION

Acknowledgements
Part of this study was funded by *Projeto de Conservação e Utilização Sustentável da Diversidade Biológica Brasileira* – PROBIO; *Conselho Nacional de Desenvolvimento Científico e Tecnológico* – CNPq; *Universidade do Estado do Rio de Janeiro* – UERJ; *Museu Nacional/Universidade Federal do Rio de Janeiro* – UFRJ; *Instituto de Pesquisas Jardim Botânico do Rio de Janeiro*, and *Programa das Nações Unidas para o Desenvolvimento* – PNUD – *Projeto* BRA/00-021- Rapid Assessment of Biodiversity Ilha Grande Bay Program. JCC received financial support from *Programa de Incentivo à Produção Científica, Técnica e Artística* – UERJ and a grant from the *Fundação Carlos Chagas Filho de Amparo à Pesquisa do Estado do Rio de Janeiro* (# E-25/170669/2004). AFP received a studentship from *Fundação Carlos Chagas Filho de Amparo à Pesquisa do Estado do Rio de Janeiro* and funding from the Nature Conservancy. The authors would like to thank the *Universidade do Estado do Rio de Janeiro* for staff help and facilities which made this study possible, and *Conselho Nacional de Desenvolvimento Científico e Tecnológico* – CNPq for the fellowship to AESO. We also thank colleagues who helped with field work and Carlos Daniel Perez and André Carrara Morandini for reviewing the manuscript.

Literature cited

Castro, C. B. and D. O. Pires. 2001. Brazilian coral reefs: what we already know and what is still missing. Bulletin of Marine Science 69: 357-371.

Castro, C. B., C. A. Echeverria, D. O. Pires, and C. G. Fonseca. 1999. Distribuição do bentos (Cnidaria e Echinodermata) em costões rochosos da Baía da Ilha Grande, Rio de Janeiro, Brasil; p. 179-193 *In* S. H. G Silva and H. P. Lavrado (ed.). Oecologia Brasiliensis: Ecologia dos Ambientes Costeiros do Estado do Rio de Janeiro. Rio de Janeiro: PPGE-UFRJ.

Creed J. C. 2006. Two invasive alien azooxanthellate corals, *Tubastraea coccinea* and *Tubastraea tagusensis*, dominate the native zooxanthellate *Mussismilia hispida* in Brazil. Coral Reefs 25: 350.

De Paula, A. F. and J. C. Creed. 2004. Two species of the coral *Tubastraea* (Cnidaria, Scleractinia) in Brazil: a case of accidental introduction. Bulletin of Marine Science 74: 175-183.

De Paula, A. F. and J. C. Creed. 2005. Spatial distribution and abundance of nonindigenous coral genus *Tubastraea* (Cnidaria, Scleractinia) around Ilha Grande, Brazil. Brazilian Journal of Biology 65: 661-673.

Creed, J. C., A. E. S. Oliveira, D. O. Pires, M. A. O. Figueiredo, C. E. L. Ferreira, C. R. R. Ventura, A. C. S. Brasil, P. S. Young, R. S. Absalão, P. C. Paiva, C. B. Castro, and C. S. Serejo. 2007. RAP Ilha Grande - um levantamento da biodiversidade: histórico e conhecimento da biota; p. 41-63 *In* J. C. Creed, D. O. Pires, and M. A. O. Figueiredo (ed.). Biodiversidade Marinha da Baía da Ilha Grande. Brasília: MMA/SBF.

Received July 2008
Accepted August 2008
Published online September 2008